

A STUDY OF GASTRIC AND DUODENAL ULCERS.*

WITH ESPECIAL REFERENCE TO THEIR SURGICAL CURE.

BY WILLIAM J. MAYO, M.D.,

OF ROCHESTER, MINNESOTA.

Surgeon to St. Mary's Hospital, Rochester, Minnesota.

THIS paper is limited in its scope to a discussion of gastric and duodenal ulcers with a view to presenting some facts as to their surgical cure. There seems to be much apprehension in the minds of the profession at large as to just what cases should be subjected to surgical treatment, and at what stage operation is to be recommended, if at all. In the following series the average duration of the pre-operative symptoms was over twelve years, and no patient was operated upon for ulcer until medical treatment had been tried over and over again without securing a permanent cure.

There is no conflict between medicine and surgery in this field, as only the cases that fail to yield to a *reasonable* amount of medical treatment should be considered surgically.

The physician is quite within reason in asking the surgeon as to the ultimate results of the operative treatment of gastric and duodenal ulcers. It is not enough that we show the mortality immediately following operation to be low, and the patient temporarily relieved, but two years of time at least should elapse after operation before the patient can be safely pronounced cured. The answer to the question is, however, not an easy one, as a number of factors must be taken into account.

In the earlier work some of the patients were not relieved because of technical errors which have now been corrected, and especially because gastrojejunostomy was, for a time, looked upon as a "cure all" and applied indiscriminately without regard to local conditions. In other instances of apparent

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failure the diagnosis was questionable, as the evidence that the disease was ulcer depended upon pre-operative clinical data, rather than pathological findings at the operating table.

It can be said too that gastric and duodenal ulcers cannot be separated from their complications, so that no review would be complete on the surgical side without including obstructions, deformities, and limiting adhesions that interfere with the gastric function even after the ulcer itself has healed.

It seems wise, therefore, to present at this time all the cases of ulcer and kindred diseases of the stomach and duodenum operated upon by Dr. C. H. Mayo and myself since the first case in 1893, a period of fifteen years, but to confine the special investigation and statistics to the ulcer group.

Total number of operations to May 1, 1908, 827; total number of patients operated upon, 768. Two hundred and twenty-five cases were operated upon for benign lesions other than ulcer and are classified in the following groups:

- I. Adhesions and bands the result of ulcer.
- II. Secondary infectious processes such as subdiaphragmatic abscess, etc., the result of perforating ulcer.
- III. Cases apparently of inflammatory origin but in which evidence that the process was ulcer proved insufficient to classify them as such.
- IV. Pyloric obstruction from contracture of the pyloric muscle, valve formation, etc., apparently not due to ulcer.
- V. Bullet and stab wounds, other traumatisms and foreign bodies.
- VI. Benign tumors, hypertrophic pyloric stenosis, syphilis and tuberculosis.
- VII. In which the stomach was opened to obtain access to the cardiac orifice for cardiospasm and benign strictures of the cesophagus. Gastrostomy, etc.
- VIII. In which the duodenum was opened to obtain access to stones and tumors in the posterior wall of duodenum, papilla and ampulla of Vater.
- IX. Obstructions and ulcerations of the stomach and duodenum caused by gall-stones.

X. Negative explorations of interior of stomach and duodenum.

This leaves 540 cases operated upon for ulcer of the stomach and duodenum.

ACUTE PERFORATIONS.

There were 27 patients operated upon for acute perforations. In 5, primary gastrojejunostomy was also done, with two deaths. In 22, closure of the perforation was made with abdominal drainage, and but one of the 18 who recovered required a secondary gastrojejunostomy, the perforation having seemingly put an end to the disease.

Acting upon this observation, I have twice, in chronic gastric ulcer where the conditions were such that I could not excise and where gastrojejunostomy was not indicated, exposed the crater of the ulcer which in each case was found comparatively small but surrounded by a mass of indurated and scar tissue. With a sharp knife I cut out the base of the ulcer, thus producing the picture of acute perforation, then closed the defect. Just what the ultimate outcome will be I do not know, but the immediate results have been most favorable.

DEVELOPMENT OF THE SURGICAL TREATMENT OF CHRONIC ULCER.

Our experience with the surgical treatment of chronic gastric and duodenal ulcers can be divided into three stages:

First, the period previous to 1900.

Second, the period from 1900 up to and including 1905.

Third, from 1905 to the present time.

First Period.—The surgery of chronic gastric and duodenal ulcers previous to 1900 might be called the surgery of benign obstructions, as the majority of operations were for gross lesions. The relief afforded by these operations was immediate and permanent in all but a few cases where technical failure to secure good gastric drainage was at fault. The operative mortality was about six per cent.

Two varieties of operations were employed: Gastrojejunostomy and pyloroplasty. Unfortunately one-third of our cases subjected to the pyloroplasty of Heinike-Mikulicz required secondary operation. Gastrojejunostomy we then as now generally employed, but made it anteriorly with the Murphy button. The character of the complications subsequent to this operation varied from the occasional dropping into the stomach of the button to the contraction of the opening due to the traction weight of the attached intestine at the point of anastomosis. Volvulus of the loop and incarceration of the small intestine through the loop, each, however, accounted for the necessity of a secondary operation.

At the meeting of the American Surgical Association, 1902, I reported seven of these mishaps, but in spite of technical errors, operations during this early period were very successful. The Murphy button demonstrated the great possibilities of gastro-intestinal surgery and the occasional failure of the button stimulated efforts toward betterment of methods.

We learned by experience that within reasonable limits the greater the obstruction the more certain the cure, and we also learned the value of having the opening in the stomach at the lowest point (*ANNALS OF SURGERY*, 1902), for we noticed that after the button was placed, all of those cases in which the traction weight on the anterior gastric wall caused a funnel to form gave successful results, and, as will be shown later, the majority have remained well up to the present time—from eight to fifteen years.

Second Period.—Stimulated by these early successes, the next six years were marked by the invasion of new fields; we were no longer contented to wait for starvation through obstruction to force operation, but rather attempted to forestall this final stage and by earlier operation terminate the disability, relieving the patient from the underfeeding and pain which are such marked symptoms of the malady.

The results in this group did not compare favorably with the early period in which the problem was purely one of mechanics arising from interference with gastric drainage, or

with the third period in which technical errors had been largely eliminated and a sound pathological basis substituted for fallacious clinical observations.

The problem was approached with the knowledge gained from the operative treatment of obstruction, but when this was put into actual practice where there was no obstruction, it was very quickly found that the stomach was not a bag emptying itself by gravity, but a muscular organ which always propelled the food toward the pylorus, and that if the pyloric end of the stomach and the upper duodenum were not interfered with mechanically or otherwise by the presence of an ulcer, that the food would not pass out of the gastrojejunostomy opening, but in spite of it would continue through the pylorus. While this position was disputed at the time by eminent authorities, I believe that it is now generally accepted. In some cases, where the ulcer was situated at a considerable distance above the pylorus, a certain amount of benefit did occur, however, by reason of the passive drainage of the irritating gastric secretions through the artificial stoma during the period in which the stomach was fasting and inactive.

It was eventually discovered that ulcers which exist to the left of the pyloric end of the stomach should, if possible, be excised, but if in doing this deformity was created which would interfere with the progress of food, gastrojejunostomy should in addition be performed.

The excision of gastric ulcers was still further stimulated in that a considerable percentage of ulcers later degenerated into cancer. In 180 cases of our own in which part of the stomach was resected, cancer on ulcer base was demonstrated in 54 per cent. Ulcer of the duodenum seldom undergoes malignant metamorphosis, so that this indication for excision does not apply with the same force to duodenal ulcers.

During this second period great efforts were made to improve the technic of gastrojejunostomy. Where pyloric obstruction was present almost any method gave good results, but if no obstruction existed some of the biliary and pancreatic secretions were liable to enter the stomach, and this annoying

complication occasionally led to the necessity for an entero-anastomosis to check the disturbance.

Roux, Doyen and others invented primary operations combining entero-anastomosis in some form with gastrojejunostomy, while Eiselberg proposed to artificially obstruct the pylorus, thinking to produce the favorable conditions known to be present in obstructions.

The posterior operation gradually replaced the anterior as the popular method. The loop was eliminated, and we no longer turned the jejunum to the right, but sutured it to the stomach as it runs normally downward and to the left.

We have made over 300 gastrojejunostomies for ulcers of the stomach and duodenum by this particular method with a mortality of less than one per cent., and but three cases have required a secondary operation upon the stomach for any cause.

In all "loop" operations, anterior or posterior, the intestine is applied to the stomach downward and to the right, but in the "no loop" method we found that this sometimes caused angulation as it turned the jejunum at the duodeno-jejunal angle rather sharply from its normal position, and occasionally caused chronic bile regurgitation.

The vertical attachment of the jejunum to the stomach as originally practised by Mikulicz with a transverse intestinal incision, and by Czerny with the Murphy button, has been recently revived by Mr. Moynihan, who is now using it with the longitudinal intestinal incision. (*ANNALS OF SURGERY*, April, 1908.)

Technical errors were, however, not the sole cause of failure to cure. The whole subject was pathologically undeveloped; we did not always know at the operating table whether ulcer was present or not, and we failed to differentiate ulcer from non-operative diseases of the stomach, and occasionally operated upon patients who would have been better treated otherwise. In the beginning we really had little exact knowledge of the living pathology of ulcer excepting its complications: obstructions, perforation and hemorrhage. The clinical

symptomatology was based upon an erroneous pathology, teaching that chronic ulcer frequently confined itself to the mucous coat, consequently gastrojejunostomy was often done when no ulcer could be found, under the mistaken idea that an ulcer actually existed but was hidden in the interior of the stomach, and a number of patients whom the operation had failed to relieve because they did not have gastric or duodenal ulcer were recorded by both physician and surgeon as instances of operative failure to cure, instead of a *mistake both in diagnosis and operation*, which was the fact.

In 14 cases of our own and a number in which the primary operation was done by other surgeons, we have re-operated for trouble of this description and often failed to find any trace of an ulcer; we have, therefore, in such cases, cut off the gastrojejunostomy and closed both sides, restoring the gastrointestinal canal to its normal continuity. Strange to say that following this temporary gastrojejunostomy nearly half of the patients were relieved of their original discomfort, but sufficient time has not elapsed for us to know whether this will be permanent.

The Finney operation gave remarkably good ultimate results in pyloric obstructions, but in cases of unhealed ulcers existing proximal to or distal from the parts involved in this operation, less benefit was derived unless the ulcer lay within the zone of the operative field so that it could be coincidentally excised.

The mortality of this second period was not greatly reduced, remaining at about five per cent., largely because a number of these patients had complicated operations, and in some instances several operations, which increased the mortality; but in spite of these developmental errors the large majority of true ulcers were relieved or cured as will be demonstrated later.

Third Period.—The third period covers about two and one-half years. The doubtful cases have been eliminated, and a living pathology established which enables the surgeon to recognize the ulcer at the operating table. If the ulcer is not

actually demonstrated, no gastric operation is undertaken unless necessitated by hemorrhage.

Gastrojejunostomy is still our most valuable operation, especially for duodenal ulcer, which is the lesion in nearly two-thirds of our cases. (Fig. 1.)

The operation of Finney is chosen for pyloric strictures. (Figs. 2 and 3.)

Ulcers in the stomach at a distance from the pylorus are excised. (Figs. 4 and 5.)

If hour-glass contraction is present, the whole diseased area is excised. (Figs. 6 and 7.) If it is not possible to do this, proximal gastrojejunostomy is performed.

Calloused ulcer of the pyloric end of the stomach indicates the operation of Rodman (Figs. 8 and 9), consisting of resection of the diseased area with closure of the duodenum and independent gastrojejunostomy. (Modified Billroth, No. II, for cancer.)

The mortality of even the more complicated operations does not exceed three per cent., while the cures will, I believe, run ninety-five per cent. or over.

SURGICAL CURES OF GASTRIC AND DUODENAL ULCERS.

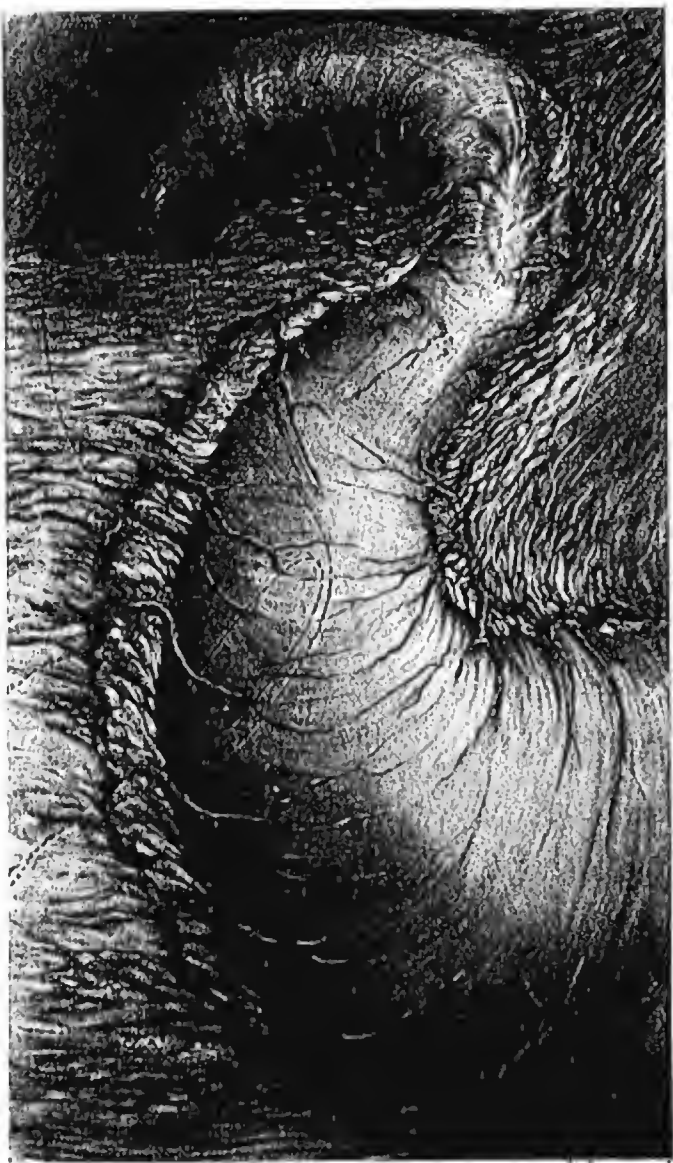
Three hundred and seventy-nine cases of gastric and duodenal ulcer were operated upon by us previous to June 1, 1906, consisting of 211 males and 168 females with an operative mortality of 4.8 per cent.

In 64 of these no ulcer was actually demonstrated at the time of operation, the record stating that they were clinical, medical, or mucous ulcers, as they were then called.

In some, slight points of apparent thickening were found, or spots where the mucous membrane did not "seem to glide on the muscular tunic as it should," and this was accepted as evidence, but in our later work actual search of the mucosa for such supposed lesions did not often show their existence.

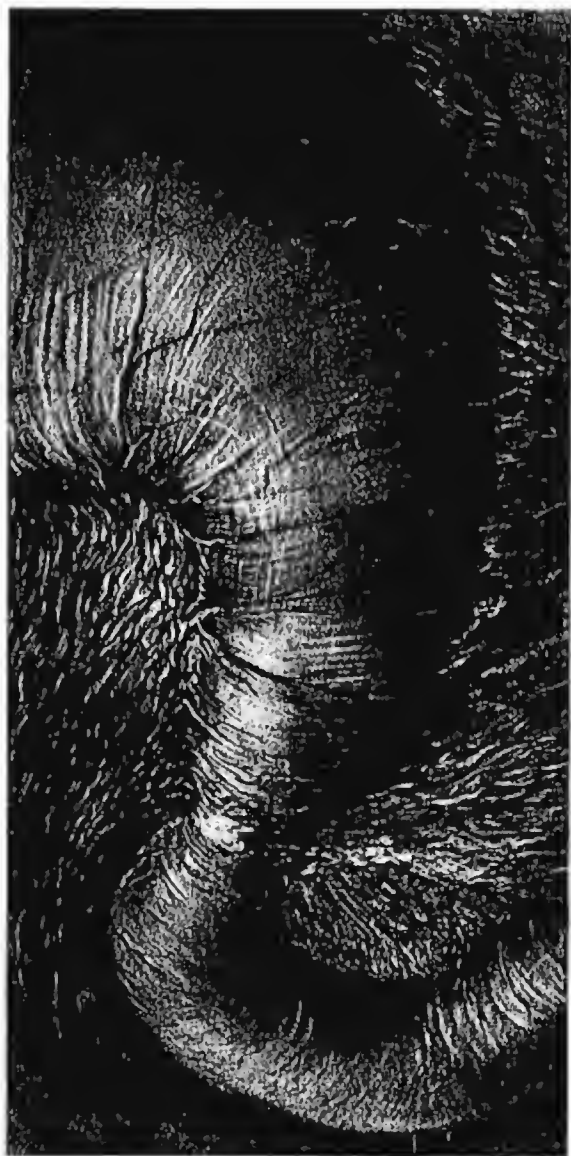
This brings up the important question: Can *chronic* ulcer exist without visible and pronounced evidence in the walls of the stomach and duodenum? We must admit that this is a

FIG. 1.



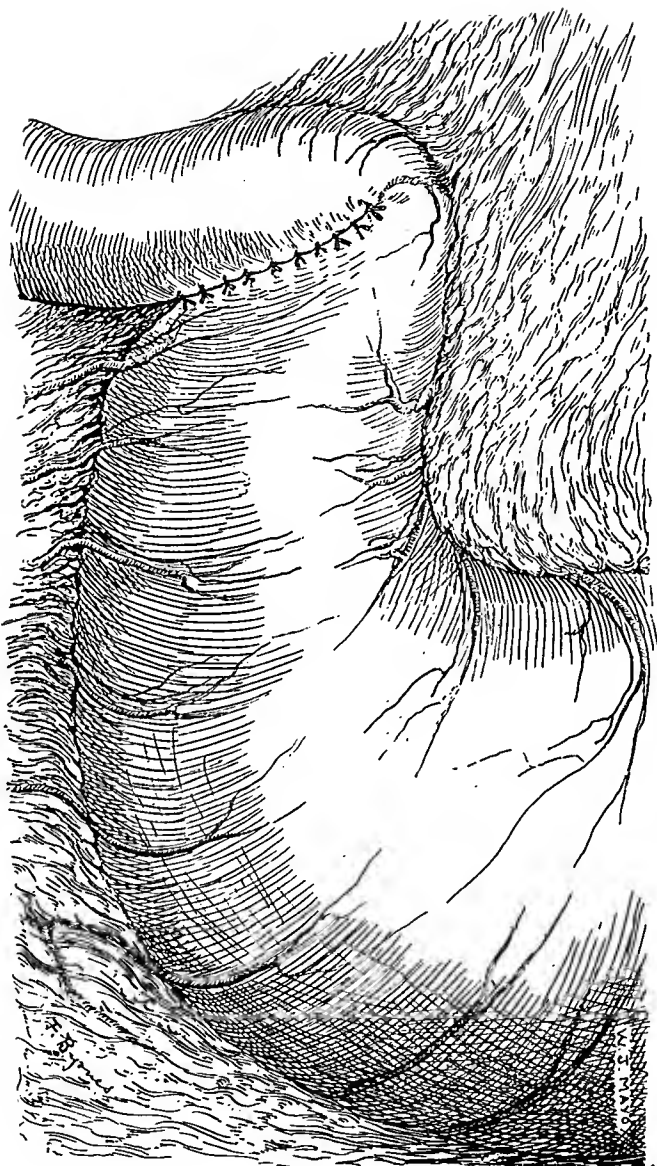
Ulcer of the duodenum and gastrojejunostomy after the posterior "no loop" method. Jejunum applied to the stomach as it normally runs, to the left and downward.

Fig. 2



Pyloric stricture. Finney's gastroduodenostomy indicated.

FIG. 3.



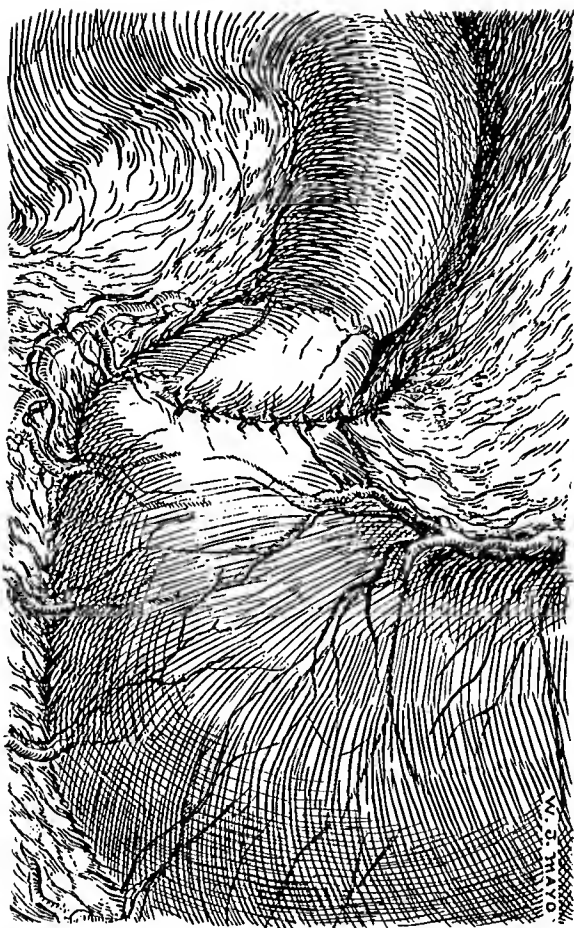
Result of Finney operation. (See FIG. 2.)

FIG. 4.



Saddle ulcer of the lesser curvature without causing serious obstruction and indicating excision. (See Fig. 5.)

FIG. 5.



Result of excision of saddle ulcer. (See FIG. 4.)

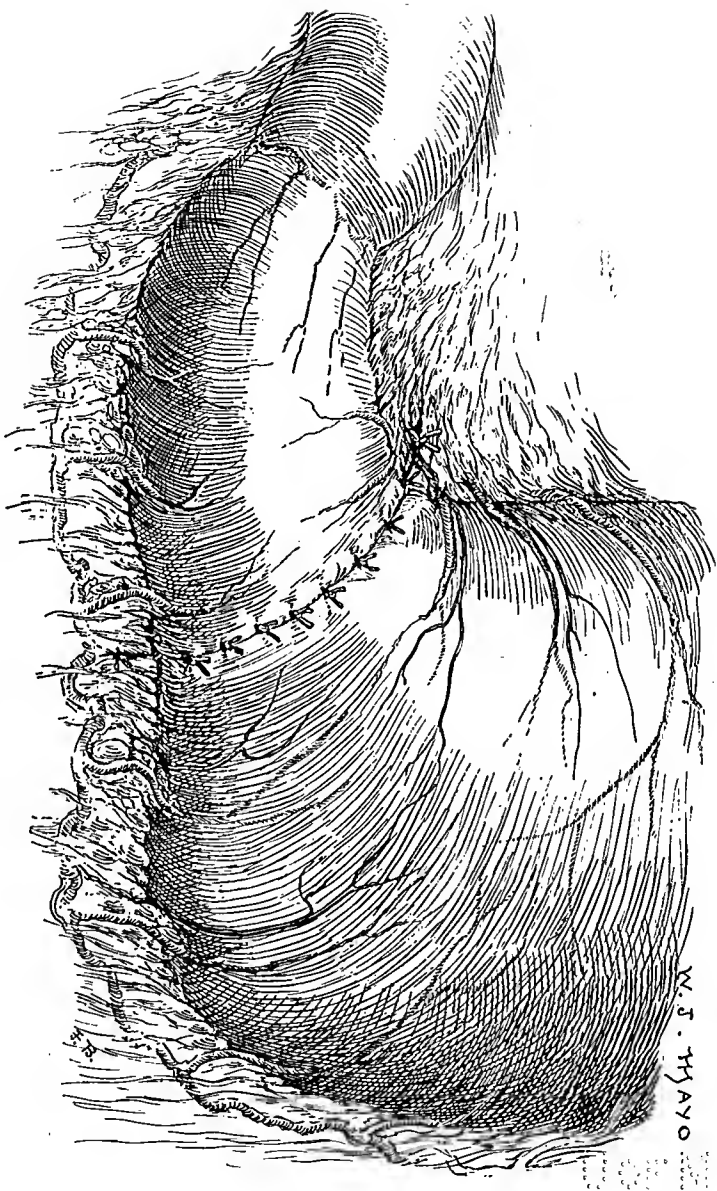
FIG. 6.



Hour-glass stomach. Dotted lines show proposed resection. (See Fig. 7.)

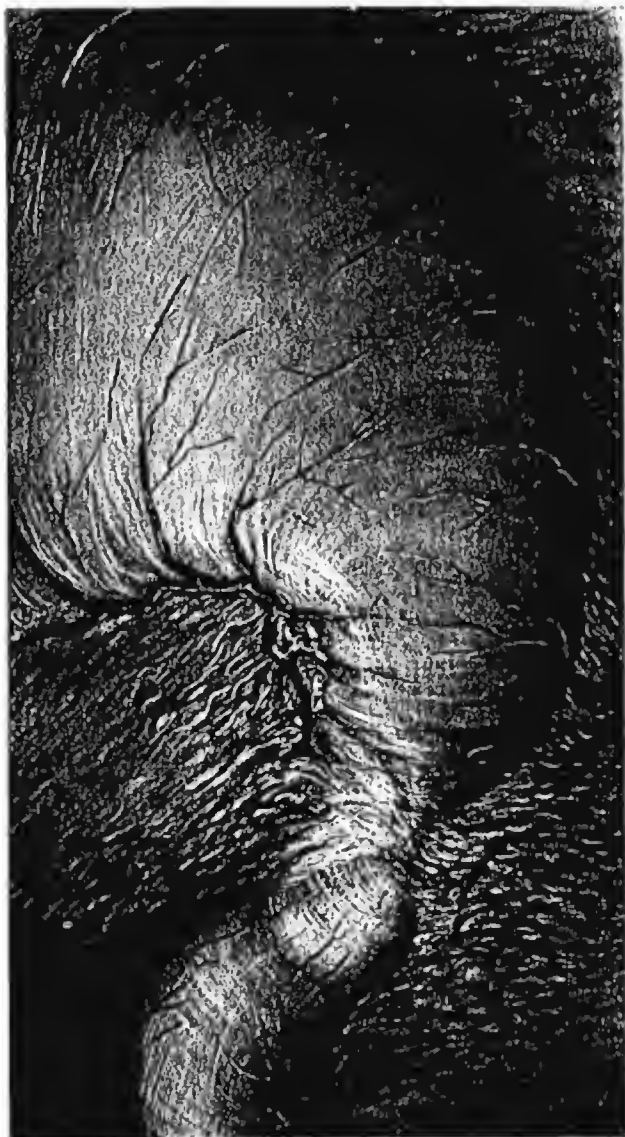
U 70 U

FIG. 7.



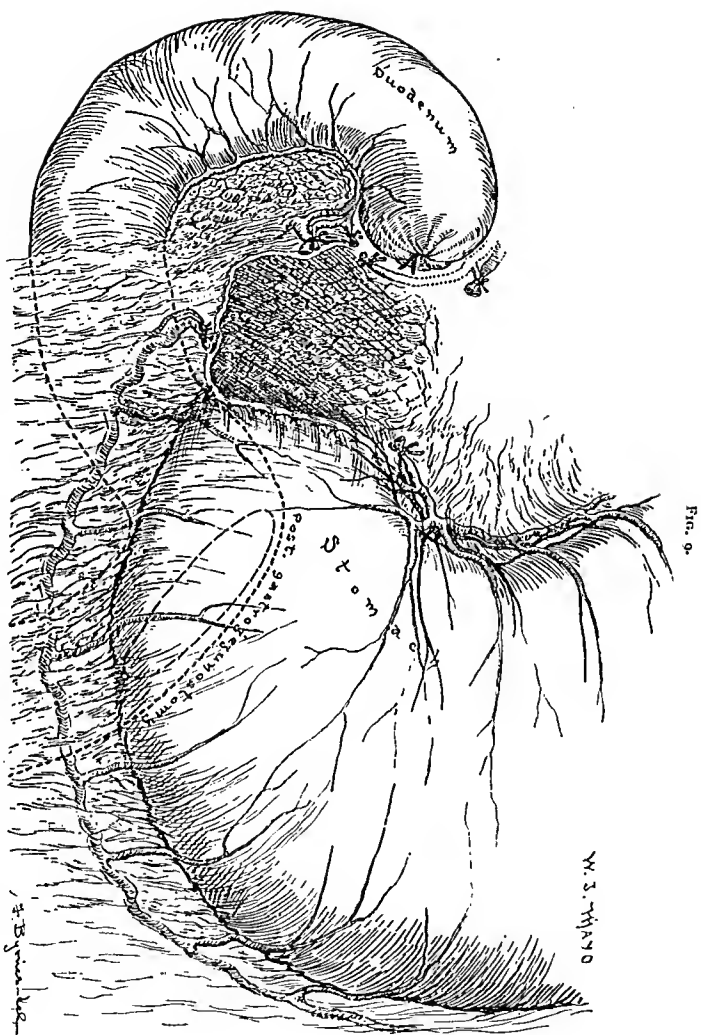
Result of resection of the obstructing ulcer in the hour-glass stomach. (See FIG. 6.)

FIG. 8.



Calloused ulcer at pyloric end of stomach. Indicating resection. (See Fig. 9.)

M 70 U



Result of Rodman's excision of pyloric end of stomach for calloused ulcer with gastrojejunostomy. (See Fig. 8.)

rare possibility. We have operated upon a few cases in which we were unable to detect an ulcer even after careful intragastric investigation when the history seemed to demonstrate that an ulcer was present.

Eleven, or 17 per cent. of the 64 patients, required supplementary operations at a later date. In nine, no ulcer was discovered at the second operation, but in two an ulcer was found which had been previously overlooked. It seems fair, therefore, to put all of these 64 cases, excepting the two just mentioned in which the ulcer was shown at the second operation, in a separate classification as questionable. All of these were operated upon in the second period between 1900 and 1906. Since that time no questionable cases have been submitted to operation.

Of this questionable group we have obtained knowledge of 50. Seventeen, or 34 per cent., were cured. Fourteen, or 28 per cent., improved. Sixteen, or 32 per cent., unimproved, and, 3 or 6 per cent., are dead, showing cured and improved 62 per cent.

In the 318 cases of actually demonstrated ulcer, we have traced 234. Of these 189, or 80.7 per cent., are cured. Twenty-one, or 9 per cent., improved, 10, or 4.2 per cent., unimproved, and 14, or 6 per cent., have died since the operation from various causes; in only two cases, however, was the cause of death connected with the stomach, showing a total of 89.7 cured and improved.

In conclusion, let me say that ulcer patients need careful regulation of diet, etc., following operation, and should be under medical supervision until they have made a complete recovery.